

Published to advance the Science of cold-blooded vertebrates

PATTERNS OF MACKEREL MARKINGS

On Oct. 29, 1922, the writer saw the first of the annual run of "tinker" Mackerel off Dosoris Lane, north shore of Long Island.

The first one seen had made a rush at a flounder bait as the line was being drawn up but did a characteristic quick stop before reaching the bit of sand-worm on the hook and then was gone in the same instantaneous fashion in which he had arrived.

Later in the day several small schools were seen but though they tarried to some extent to look at such bait as was offered, the fish apparently were not hungry for the schools passed along at pretty good speed and were to be seen swimming at the surface in various directions. This restlessness and indifference to food is fairly constant with the small Mackerel during the first few days of their arrival in the Sound.

Five days later on Nov. 3, these fish had settled down to some extent and the writer through the use of "chum" in the water about the boat was given an opportunity to observe.

As the tide slacked they came, first a few stragglers, moving about through the "chum." These quickly disappeared. Presently a larger number and again more and more coming and going until

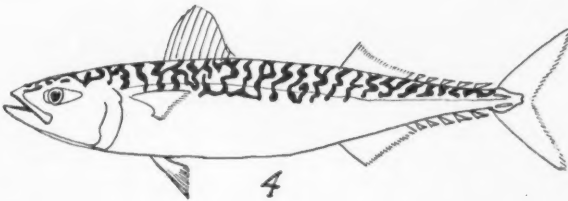
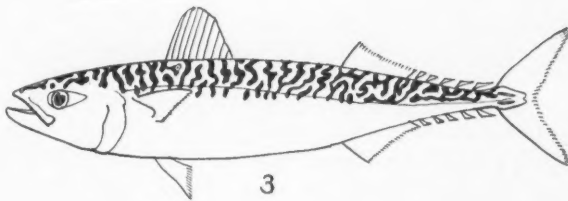
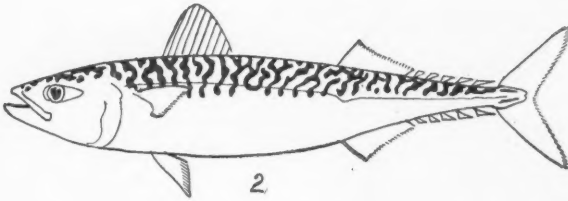
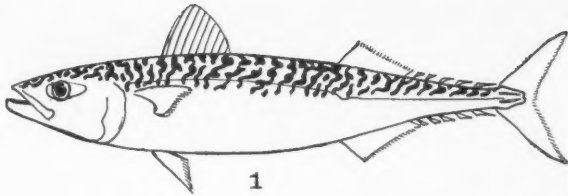
finally at dead slack tide there were two hundred or more in sight constantly and they began taking the chum and the baited hooks.

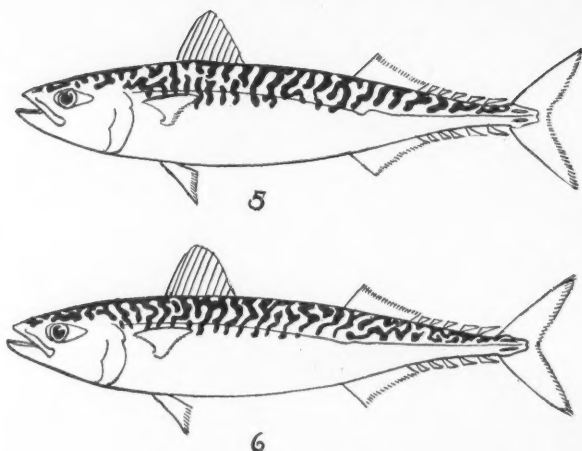
In size and form these fish perfectly justified the Gloucestermen's simile, "As like as two No. 1 Mackerel." There were some more or less obvious differences in color, some being a yellower green than others; but the writer's attention was fixed chiefly by the great individual differences in the patterns of dark markings and more particularly by the asymmetry of marking on the single fishes. This was so pronounced it could be observed as the Mackerel swam about two or three feet down.

Closer study of the captured fishes revealed many startling departures from the conventional zig-zag Mackerel pattern. It is safe to say not two fish were alike of the two or three hundred examined and that no individual of them all approached symmetry of pattern throughout its length. Some careful studies were made which show, in the lateral views, differences not only in design but in quality and continuity of line; and in the vertical views, the very pronounced lack of balance in the patterns on the right and left sides of the individuals.

Fig. 1 shows fine and rather angular lines much inclined to break into dots and short detached streaks. Just forward of the second dorsal will be observed an amalgamation of the vertical pattern into a horizontal line connecting four verticals.

In Fig. 2 the lines of dark color are somewhat heavier and represent the weight of line usually found. There are some good examples, in this figure, of the joining and splitting of lines after leaving the dorsal line. Just forward of the dorsal fin is a pronounced inverted Y. At the beginning of the dorsal fin is a small upright Y. Behind the dorsal fin four lines leaving the median line unite to

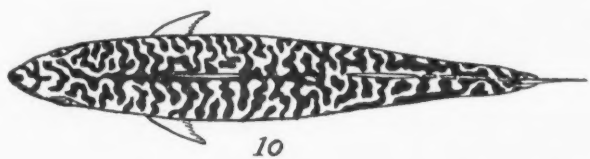
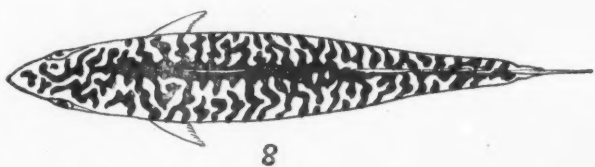
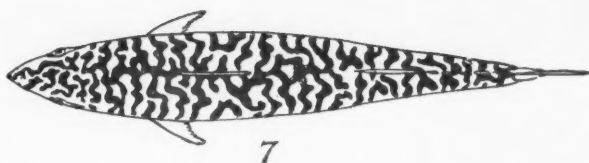




form, first an inverted U and then an upright U nearly closed at the top.

Fig. 3 shows several broken lines and spots and at the forward end of the second dorsal a curious amalgamation of three vertical lines showing a horizontal carried down to a lower case h with a period behind. Back of the second dorsal three verticals join curiously and become horizontal near the lateral line. A very striking example of this departure from the upright is seen toward the peduncle of this same fish.

Fig. 4 presents two extensive examples of the fusion of vertical lines into eccentric patterns—four lines leaving the median unite in a zig-zag horizontal which in turn becomes five verticals having free ends down except for two which fuse just below the lateral. Near the back of the dorsal fin six vertical lines unite to form a very noticeable horizontal. The posterior two of these six lines separate soon after leaving the median and then join again leaving an



island of the green color which underlies the dark markings of all these fish.

The Mackerel shown in Fig. 5 is a very heavily marked fish and shows five lines under the dorsal fin curiously broken. An interesting arrangement occurs also just above the pectoral.

In the sixth figure the fish shows rather heavy markings and unusual evenness of spacing between the lines. Under the second dorsal fin five vertical lines have become two zig-zag horizontals and from the second dorsal to the tail fin the pattern is individual.

When viewed from above the lack of symmetry in the markings of the two sides of the Mackerel strike the eye at once.

In only a few specimens was much dorsal line apparent and in these instances no pair of transverse lines departed from the same point. All were staggered as in Fig. 9 where they will be seen alternating from a short dorsal line which includes the dorsal fin. It will be noted in this specimen there is some symmetry of pattern in the region of the dorsal fin.

Fig. 7 shows slight symmetry in the transverse lines just behind the dorsal fin and in the two broken lines on the sides a little farther back.

Fig. 8 shows a pronounced dorsal line but the remaining pattern is asymmetrical in the extreme.

In Fig. 10 is shown the nearest approach to a juncture of transverse lines in the marking just forward of the pectoral fins.

The heads show no symmetry whatever and no sign of a dorsal line.

Of course each fish is balanced as a whole in that the tone is the same on both sides no matter how much the pattern may vary.

These mackerel are difficult to see through any ripple and at any acute angle in the water. The pattern and coloring probably combine to this result and must account for the startling suddenness of the appearance and disappearance of the Mackerel about the boat.—LYNN BOGUE HUNT, *Glen Cove, New York*.

FURTHER NOTES ON REPTILES COLLECTED BY THE WHITNEY SOUTH SEA EXPEDITION

Mr. K. P. Schmidt, in two previous numbers of COPEIA, (Nos. 101 and 104) has given notes and lists of specimens collected by the Whitney South Sea Expedition. Since his last report three further lots of alcoholic material have been received; the following lists are based upon these shipments. The first of these three additional lots was identified by Mr. Schmidt; the last two by the writer. The specimens were collected in Polynesia mostly in the Society, Marquesas, and Tuamotu Islands between November 1921 and December 1922. The collections are interesting because two forms are present which were not in the first shipments—a turtle, *Chelonia japonica* (Thunberg), and a lizard, *Hemidactylus garnotti* (Dumeril and Bibron).

Chelonia japonica (Thunberg) Society Islands—Scilly Atoll 2. *Hemidactylus garnotti* (Dumeril and Bibron) Rapa Island 4. *Peropus mutilatus* (Wiegmann) Society Islands—Tahiti 1, Mopelia 3, Ahii 3; Marquesas Islands—Tuhu Ata 2, Fatuhiva 3, Nukuhiya 3; Pitcairn Island 3. *Lepidodactylus lugubris* (Dumeril and Bibron) Society Islands—Raiatea 1, Scilly Atoll 1, Rangiroa 2; Marquesas Islands—Hiavaoa 1, Hiaou (Eiao or Eiau) 8; Tua-

motu Islands—Tikei (Tiku) 11, South Marutea 1, Maria 1; Pitcairn Island 4; Rapa Island 2; Oeno Island 1. *Gehyra oceanica* (Lesson) Tuamotu Islands—Tureia 2, Tenararo 7, Tikei (Tiku) 6, Takaroa 1, Takapoto 6; Marquesas Islands—Nukuhiva 3, Hivaoa 1, Ua Huka 1; Society Islands—Tahiti 1, Scilly Atoll 4, Mopelia 3, Rangiroa 2, Ahii 1. *Leiolopisma noctua* (Lesson) Marquesas Islands—Nukuhiva 8, Upu (Huapu) 3, Motane 2, Hivaoa 5, Hiaou (Eiao or Eiau) 5; Tuamotu Islands—Tikei (Tiku) 19, Fatuhiva 9, Takopoto 2, Mangareva 28, South Marutea 16, Akamaru 1; Society Islands—Tahiti 1, Mopelia 3, Scilly Atoll 5, Ahii 6; Rapa Island 7; Pitcairn Island 5. *Emoia cyanurum* (Lesson) Society Islands—Mopelia 5, Scilly Atoll 15, Fatuhuku 1, Rangiroa 1, Ahii 5; Marquesas Islands—Motane 1, Ua Huka (Huahuna) 1, Upu (Huapu) 2, Nukuhiva 5, Fatuhiva 3, Hivaoa 4; Tuamotu Islands—Maria (Moerenhout) 6, Mangareva 19, South Marutea 15, Tureia 1, Marturei vavao 1, Henderson 6, Akamaru 1, Takapoto 1, Tikei (Tiku) 5; Rapa Island 1; Pitcairn Island 14; Ducei Island 1; Oeno Island 4. *Cryptoblepharus poecilopleurus* (Wiegmann) Society Islands—Mopelia 1, Scilly Atoll 8, Rangiroa 2, Ahii 2; Marquesas Islands—Ua Huka (Huahuna) 1, Hiaou (Eiao or Eiau) 1, Fatuhuku 1; Tuamotu Islands—Nauka 1, Tikei (Tiku) 6, South Marutea 4, Tureia 1; Rapa Island, Motu Karaporo 2.—A. I. ORTENBURGER, *American Museum of Natural History*.

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